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MANUAL

**COMPONENT MAINTENANCE
WITH ILLUSTRATED PARTS LIST**

**OXYGEN SHUT-OFF VALVE
PART NO. 803800-01**

H-191

SCOTT®

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COMPONENT MAINTENANCE MANUAL WITH IPL

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INTRODUCTION

This manual establishes the proper maintenance procedures which shall be followed by user maintenance, overhaul and service personnel when performing any type of service on the 803800 Oxygen Shut-Off Valves described herein. It is the primary intent of this manual:

- A. To specify safety regulations to be followed during performance of service on oxygen equipment used in aviation applications.
- B. To establish proper sequence of operations to be performed on the defined equipment.
- C. To provide the user with the data necessary to properly maintain, check, test and repair the equipment.

The following WARNINGS are presented to inform the user of this manual of the requirements which shall be adhered to when performing service procedures on this equipment. Additional WARNINGS will be found in the procedural steps in the manual.

WARNING: ANY SERVICE OR OVERHAUL PERFORMED ON THIS APPARATUS SHALL BE DONE ONLY BY THOSE FACILITIES EXPERIENCED IN, OR BY PERSONNEL KNOWLEDGEABLE IN AVIATION OXYGEN EQUIPMENT. IF NONE ARE KNOWN, CONTACT SCOTT AVIATION OR ITS DISTRIBUTORS FOR NAMES OF AUTHORIZED SERVICE CENTERS.

WARNING: ALL PROCEDURES DESCRIBED IN THIS MANUAL SHALL BE PERFORMED IN AN AREA FREE OF OIL, GREASE, FLAMMABLE SOLVENTS OR OTHER COMBUSTIBLE MATERIALS. SUCH MATERIALS, AS WELL AS DUST, LINT, AND FINE METAL FILINGS ARE ALL POTENTIAL COMBUSTIBLES WHICH MIGHT, WHEN EXPOSED TO OXYGEN UNDER PRESSURE, IGNITE AND RESULT IN AN EXPLOSION AND/OR FIRE.

WARNING: DO NOT ALLOW OIL, GREASE, FLAMMABLE SOLVENTS, OR OTHER COMBUSTIBLE MATERIALS TO COME IN CONTACT WITH PARTS THAT WILL BE EXPOSED TO PRESSURIZED OXYGEN. SUCH MATERIALS, AS WELL AS DUST, LINT, AND FINE METAL FILINGS ARE ALL POTENTIAL COMBUSTIBLES WHICH MIGHT, WHEN EXPOSED TO OXYGEN UNDER PRESSURE, IGNITE AND RESULT IN AN EXPLOSION.

Verification Section

Date

Testing and Fault Isolation
Disassembly
Assembly

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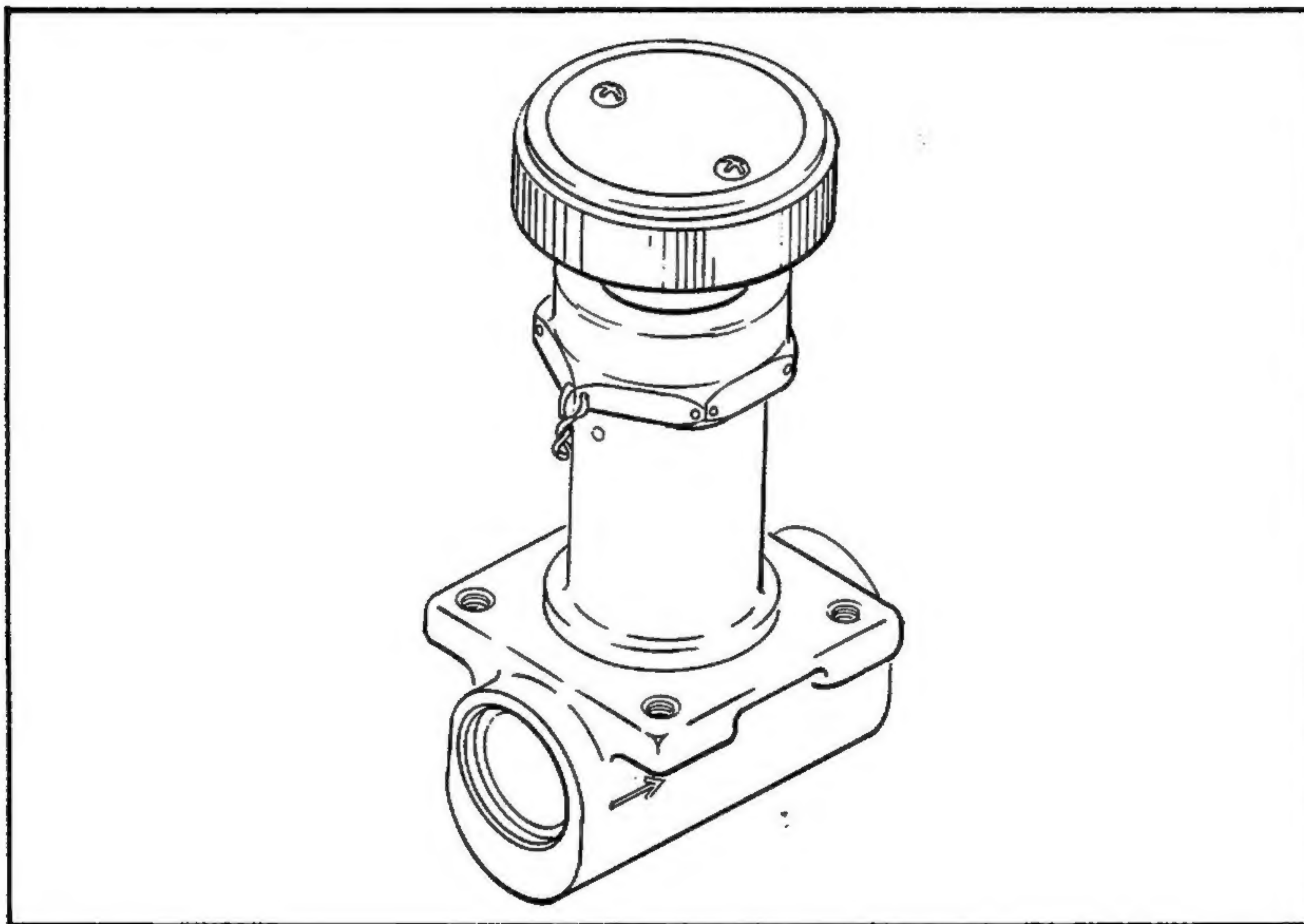
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DESCRIPTION AND OPERATION**1. General**

- A. This manual provides overhaul instructions with illustrated parts list for the Oxygen Shut-Off Valve, Part Number 803800-01 (see Figure 1).

2. Purpose of Equipment

- A. The Oxygen Shut-Off Valve, hereinafter referred to as the valve, Part Number 803800-01 (see Figure 1), is a manually operated slow opening oxygen valve capable of metering flow and designed with mounting facilities and metal to metal seating. It is rated for oxygen service up to 2000 psi. The valve is used as a line shut-off valve in the aircraft oxygen system to activate the oxygen system when installed per Figure 2.

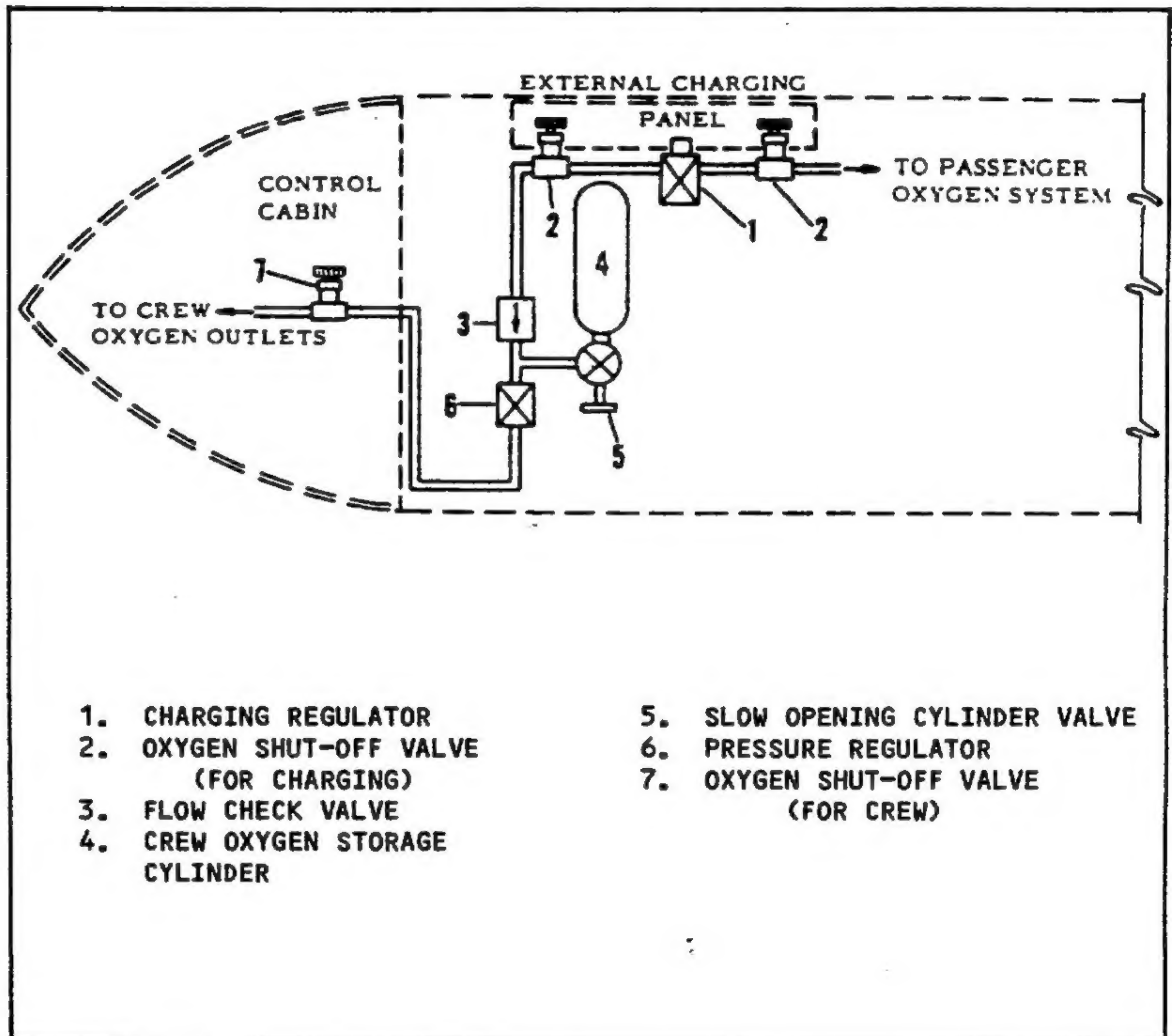


Oxygen Shut-Off Valve
Figure 1

3. Installation

CAUTION: INSTALL THE VALVE WITH THE ARROW, ON THE UPSTREAM SIDE OF THE VALVE, POINTING DOWNSTREAM.

- A. A typical aircraft installation of the valve is shown in Figure 2. During charging operations, oxygen shut-off valves (2) serve to isolate the crew or passenger oxygen systems while charging through regulator (1). Crew oxygen, which is stored in cylinder (4) and controlled by regulator (6), may be shut off in the control cabin by a similar oxygen shut-off valve (7).



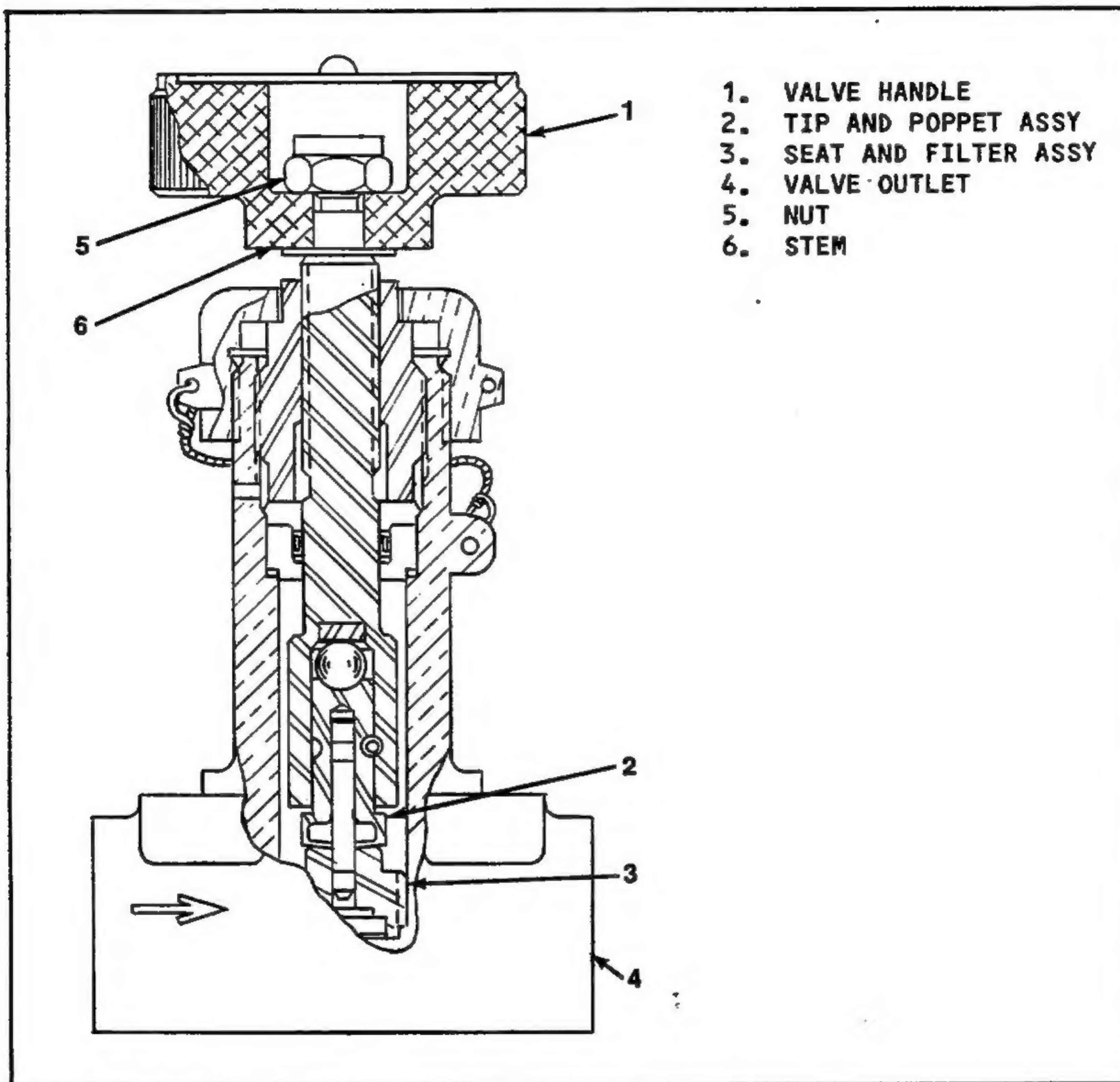
1. CHARGING REGULATOR
2. OXYGEN SHUT-OFF VALVE
(FOR CHARGING)
3. FLOW CHECK VALVE
4. CREW OXYGEN STORAGE
CYLINDER

5. SLOW OPENING CYLINDER VALVE
6. PRESSURE REGULATOR
7. OXYGEN SHUT-OFF VALVE
(FOR CREW)

Typical Installation
Figure 2

4. Operation

- A. The cross section illustrated in Figure 3 is representative of all Part Number 803800-01 slow opening oxygen valve assemblies. When valve handle (1) is opened (full counterclockwise), tip and poppet assembly (2) is raised away from seat and filter assembly (3) thereby allowing oxygen flow to valve outlet (4). Nut (5) secures valve handle (1) to stem (6).



Oxygen Valve Assembly Cross Section
Figure 3

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- B. These valves restrict flow only during the initial opening phase, and will prevent a downstream dead-ended system from being brought up to system pressure too rapidly.

NOTE: Rapid pressurization of a system is adiabatic in nature and may result in a potentially hazardous temperature rise.

As with all valves, it should be opened fully and then backed off 1/4 of a turn. The valve is fully open at approximately 4 turns.

Valve Characteristics

- | | |
|---|-----------------------------------|
| (1) Torque to open or close (Maximum) | 20 inch pounds (2.3 N.m) |
| (2) Full open position | 4 turns (approximately) |
| (3) Permissible leakage across seat
with valve closed (internal leakage) | 50 cm ³ /min (Maximum) |

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TESTING AND FAULT ISOLATION1. Testing

WARNING: IN ALL PROCEDURES LISTED BELOW, OXYGEN IS SPECIFIED AS THE TEST GAS. WATER PUMPED NITROGEN OR OIL-FREE AIR MAY BE SUBSTITUTED, BUT RESULTS MUST BE CONVERTED PRIOR TO BEING COMPARED WITH THE RESULTS SPECIFIED FOR OXYGEN. DO NOT, UNDER ANY CIRCUMSTANCES, USE OIL PUMPED GAS AS THIS WILL CAUSE CONTAMINATION OF THE VALVE AND TEST EQUIPMENT. OIL, EVEN IN MINUTE QUANTITY, COMING IN CONTACT WITH OXYGEN MAY CAUSE AN EXPLOSION OR FIRE.

NOTE: Table 101 lists the consumable materials necessary for testing. Equivalent materials may be used.

MATERIAL	DESCRIPTION	MANUFACTURER*	REFER TO TESTING PARA
Oxygen	MIL-D-27210, Type I	V07098	A (3) B (2)
Rust Inhibiting Leak Test Solution	Sodium Chromate; 5cc per gallon of water	V72658	A (4)

*Refer to Illustrated Parts List, paragraph 2.C for Vendor Code.

List of Consumable Materials for Testing
TABLE 101

A. Check Leakage

- (1) Plug the valve outlet (downstream of arrow head).
- (2) Turn handle (15, IPL Fig. 1) 1-1/2 turns open.
- (3) Apply an oxygen pressure of 2000 psi to valve inlet.
- (4) Submerge valve in water, treated with rust inhibitor, for five minutes.
- (5) External leakage shall not exceed 5 cc/hr.
- (6) Turn handle (15) to full closed position.
- (7) Vent downstream pressure.
- (8) Remove plug from valve outlet.
- (9) Attach a hose to valve outlet and submerge open end of hose in water for two minutes.
- (10) Internal leakage shall not exceed 50 cc/min.
- (11) Repeat steps (1) through (10) with 50 psi applied for two minute duration for each test.
- (12) Remove hose from valve outlet.
- (13) Dry valve with clean, dry, oil-free air or nitrogen.

NOTE: Crack valve slightly to purge, thus assuring that all water and moisture are removed from the valve.

B. Check Valve Flow

- (1) Turn handle (15, IPL Fig. 1) to full closed position.
- (2) Apply an oxygen pressure of 2000 psi to valve inlet.
- (3) Connect flowmeter to valve outlet.
- (4) Open valve gradually, and check flow versus handle position per Fig. 101.

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- (5) Check handle turning torque during test. Torque required to open or close valve must not exceed 20 inch-pounds (2.3 N.m).

VALVE HANDLE TURNS FROM CUT OFF POSITION	OUTLET FLOW-LITERS/MINUTES	
	MINIMUM FLOW*	MAXIMUM FLOW*
1/4	10	50
1/2	20	200
3/4	40	550
1	50	900
1-1/4	80	1250
1-1/2	110	1600
<p>*Outlet flow depends on valve handle (15, IPL Fig. 1) position. When the valve is fully closed, a 3/4 turn, counterclockwise, would be required before flow begins. If the valve handle is rotated clockwise so that flow is just cut off, flow will begin almost immediately on counterclockwise rotation of the valve handle.</p>		

Valve Handle Position and Outlet Flow
Figure 101

2. Fault Isolation

A. Refer to Fig. 102 for a chart containing troubles, probable causes and remedies.

TROUBLE	PROBABLE CAUSE	REMEDY
Leakage between stem (60, IPL Fig. 1) and sleeve (35) (External Leakage)	Faulty seal (45, IPL Fig. 1)	Replace seal using kit (95, IPL Fig. 1)
	Faulty stem (60)	Replace valve stem
	Faulty washer (55)	Replace washer
	Loose sleeve (35)	Retorque sleeve per Table 801
Internal leakage in excess of 50 cc/min.	Faulty seat and filter assy (85)	Replace or retorque seat and filter assy per Table 801
	Faulty tip and poppet assy (65)	Replace tip and poppet assy
Torque required to open or close valve exceeds 20 inch-pounds	Damaged external threads on stem (60)	Chase threads or replace stem
	Damaged internal threads on sleeve (35)	Chase threads or replace sleeve

Trouble Shooting Chart
Figure 102

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DISASSEMBLY (See IPL Figure 1)

NOTE: See Testing and Fault Isolation to establish the condition of the unit or most probable cause of its malfunction. This is to determine the extent of disassembly required without completely tearing down and rebuilding the unit.

1. Disassemble the valve as follows:

- A. Cut and remove lockwire from retainer (30, IPL Fig. 1) and body (90).
- B. Remove two screws (10) and identification plate (5).
- C. Remove nut (20) and valve handle (15).
- D. Remove retaining ring (25).
- E. Unthread and remove retainer (30).
- F. Back-out sleeve (35) until it is disengaged from body then pull stem (60) with all components mounted to it, out of body.

CAUTION: IF SEAL (45) IS REMOVED FROM STEM (60), IT CANNOT BE REPLACED BY ANOTHER SEAL ALONE. KIT (95) SHALL BE USED.

- G. Remove sleeve (35) from stem (60), then remove guide (40). If replacement of seal (45) is required, slide retainer (50) with seal (45) off stem (60). Press seal (45) out of retainer (50), being careful to avoid marking seal contact surface on interior of retainer (50). If seal does not require replacement, the seal and retainer should be cleaned while assembled on stem (60), being careful not to scratch or mark stem sealing surface. Do not clean by immersion into solvent to avoid trapping solvent in seal (45).

CAUTION: DO NOT MAR STEM (60) WITH DRIFT PIN.

- H. To remove tip and poppet assembly (65), carefully drive pin (70) from stem (60) using a hammer and drift pin.
- I. Remove ball (75) and bearing (80).
- J. Unthread seat and filter assembly (85) from body (90).



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CLEANING

NOTE: Cleaning materials used for the procedures described herein are listed in Table 401. Equivalent materials may be used.

MATERIAL	DESCRIPTION	MANUFACTURER*	REFER TO PARA
1,1,1 Trichloroethane (stabilized)	MIL-T-81533	V91784	1.A
*Refer to Illustrated Parts List, paragraph 2.C for Vendor Code.			

List of Cleaning Materials
TABLE 401

WARNING: DO NOT ALLOW OIL, GREASE, FLAMMABLE SOLVENTS, OR OTHER COMBUSTIBLE MATERIALS TO COME IN CONTACT WITH PARTS THAT WILL BE EXPOSED TO PRESSURIZED OXYGEN. SUCH MATERIALS, AS WELL AS DUST, LINT, AND FINE METAL FILINGS, ARE ALL POTENTIAL COMBUSTIBLES WHICH MIGHT, WHEN EXPOSED TO OXYGEN UNDER PRESSURE, IGNITE AND RESULT IN AN EXPLOSION.

1. Metal parts which come in contact with oxygen and have become contaminated can be cleaned using the following method.

WARNING: USE 1,1,1 TRICHLOROETHANE IN A WELL-VENTILATED AREA ONLY. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN AND INHALATION OF TOXIC VAPORS. SUITABLE EYE PROTECTION SHALL BE WORN DURING CLEANING PROCEDURES TO PREVENT EYE INJURIES.

- A. Use a vapor degreasing method with stabilized 1,1,1 Trichloroethane. Blow clean and dry with a stream of clean, dry, oil-free air.

2. Metal parts should be cleaned prior to assembly using the method described above.

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CHECK

1. Inspect parts of valve (see IPL Fig. 1).

- (1) Visually examine all parts for cracks, nicks, burrs, damaged threads, or other evidence of damage.
- (2) Visually examine all metal parts that may come into contact with oxygen for contamination.
- (3) Visually examine all metal parts for wear and/or corrosion.
- (3) Visually examine valve seats for scoring.

NOTE: Refer to Table 801 for acceptable fits and clearances.



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REPAIR (See IPL Fig. 1)

1. Repairs shall be limited to the removal of burrs or thread chasing. All parts found to be otherwise damaged or worn shall be replaced with only Scott parts.

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- A. At overhaul, replace washer (55) and seat and filter assembly (85) regardless of condition.

CAUTION: DO NOT ATTEMPT TO INSTALL SEAL (45) BY ITSELF. USE SEAL REPLACEMENT KIT (95) ONLY TO REPLACE SEAL.

- B. Replace seal (45), only if required with seal replacement kit (95).

ASSEMBLY

NOTE: Materials used during assembly of the valve, as described herein, are listed in Table 701. Equivalent materials may be used except for oxygen lubricant.

MATERIAL	DESCRIPTION	MANU-FACTURER*	REFER TO PARA
Loctite	Loctite, Grade A	V05972	1.K
Oxygen Lubricant	Krytox 240AC	V18873	1.B
Lockwire	MS20995C20	-----	1.I

*Refer to Illustrated Parts List, paragraph 2.C for Vendor Codes.

List of Consumable Materials for Assembly
TABLE 701

1. Assemble the valve as follows: (See IPL Fig. 1)

WARNING: DO NOT ALLOW OIL, GREASE, FLAMMABLE SOLVENTS, OR OTHER COMBUSTIBLE MATERIALS TO COME IN CONTACT WITH PARTS THAT WILL BE EXPOSED TO PRESSURIZED OXYGEN. SUCH MATERIALS, AS WELL AS DUST, LINT, AND FINE METAL FILINGS, ARE ALL POTENTIAL COMBUSTIBLES WHICH MIGHT, WHEN EXPOSED TO OXYGEN UNDER PRESSURE, IGNITE AND RESULT IN AN EXPLOSION.

- A. Torque seat and filter assembly (85, IPL Fig. 1) into body (90) per Table 801.
- B. Place bearing (80) in stem (60), then install ball (75) after sparingly applying a wipe coat of Krytox to the ball.

NOTE: Use Krytox sparingly.

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- C. Attach tip and poppet assembly (65) to stem (60) with pin (70), if it was disassembled.
- D. Drop washer (55) into body (90) then slide retainer (50) over stem (60).
- E. Install seal (45) using kit (95) and instructions contained in the kit, if it was removed during disassembly.
- F. Slide guide (40) over stem (60).
- G. Thread sleeve (35) onto stem (60) until it bottoms on guide (40).
- H. Install components assembled in steps (B) through (G) into body (90) until they bottom.
- I. Torque sleeve (35) into body (90) per Table 801 after applying a wipe coat of Krytox to 5/16-24 threads of stem (60).
- J. Thread retainer (30) onto body (90). Lockwire the retainer to body (90) per applicable instructions of MS33540.
- K. Install retaining ring (25).
- L. Apply a coat of Loctite to threads on tip of stem (60). Slide handle (15) onto stem (60) and retain in place with nut (20).
- M. Install identification plate (5) with two screws (10).

2. Storage Instructions

A. Prepare the valve for storage as follows:

- (1) Seal all valve ports to prevent foreign matter from entering valve.
- (2) Do not use any preservative coating on valve.
- (3) Place valve, with desiccant, in plastic bag and seal plastic bag.
- (4) Store in dry area.

FITS AND CLEARANCES

1. Table 801 presents the torque values necessary to assemble the valve.

UNIT	TORQUE lbf.in (N.m)
Seat and Filter Assy (85, IPL Fig. 1)	240 inch-pounds max. (27.1)
Sleeve (35, IPL Fig. 1)	160 inch-pounds (18.1)

Assembly Torque Values
TABLE 801

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SPECIAL TOOLS, FIXTURES AND TEST EQUIPMENT

1. There are no special tools, fixtures or test equipment required or authorized at this time.



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ILLUSTRATED PARTS LIST

1. This illustrated Parts List covers Oxygen Shut-Off Valve, Part Number 803800-01.
2. Group Assembly Parts List
 - A. The Group Assembly Parts List consists of a parts listing and completely indexed exploded-view drawing.
 - B. The quantities listed in the "UNITS PER ASSY" column are the total quantity used per valve at the locations indicated.
 - C. The part numbers listed in the "PART NUMBER" column are Scott Aviation part numbers except standard parts, which are listed by "MS" part numbers. The following list contains the code, name, and address of vendors supplying parts and materials for the valve including those listed in Tables 101, 401 and 701.

VENDOR'S CODE

<u>CODE</u>	<u>NAME AND ADDRESS</u>
V07098	Linde Division of Union Carbide Tonawanda, New York
V18873	E.I. DuPont de Nemours & Co., Inc. Petroleum Chemicals Division Wilmington, Delaware
V05972	Loctite Corporation Newington, Connecticut
V71984	Dow Corning Corporation Midland, Michigan
V91784	Hooker Chemical Corp. Niagara Falls, New York

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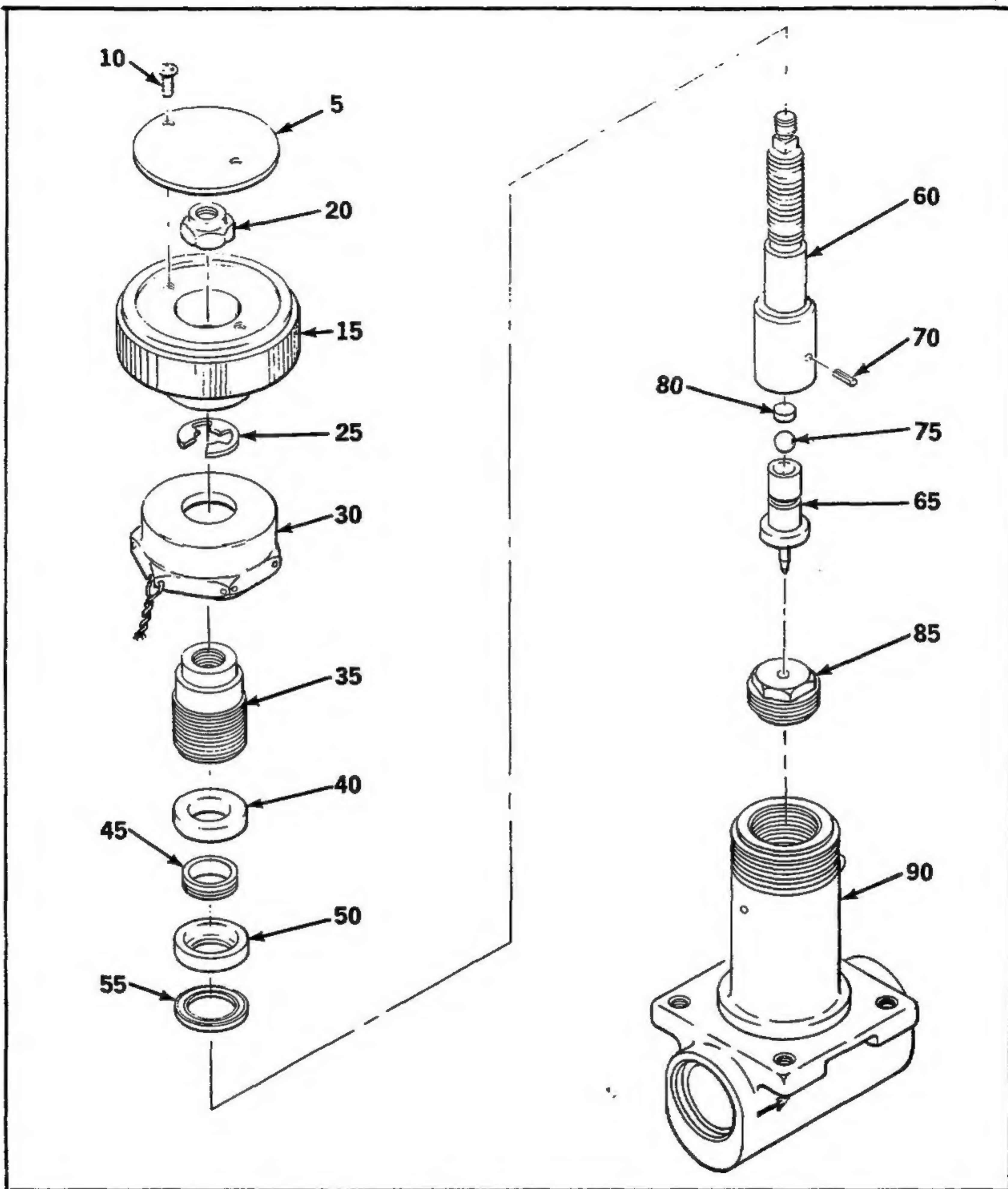
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- D. In the "EFFECT CODE" column, the effect code letter adjacent to the part signifies the end item to which the part belongs. No effect code letter (blank) indicates that the part is interchangeable between all end items.

3. How to use this Illustrated Parts List

- A. If neither the part number nor the nomenclature is known, the part can be compared with the exploded-view illustration. When located on the illustration, the index number on the illustration will refer to the item number in the Group Assembly Parts List which identifies the part number and the nomenclature.



**Oxygen Shut-Off Valve
Figure 1**

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FIG. ITEM	PART NUMBER	AIRLINE STOCK NO.	NOMENCLATURE 1234567	EFF CODE	UNITS PER ASSY
1-1	803800-01		VALVE ASSY, OXYGEN SHUT-OFF		RF
5	10007846		. PLATE, ID ATTACHING PARTS		1
10	59553-00		. SCREW -----*		2
15	10007852		. HANDLE, VALVE ATTACHING PARTS		1
20	MS20365-1032A		. NUT -----*		1
25	MS16633-3021		. RING, RETAINING		1
30	10003307		. RETAINER, PACKING		1
35	10003313		. SLEEVE		1
40	10003580		. GUIDE		1
45	36180-001		. SEAL, RECIPROCATING		1
50	10003579		. RETAINER, SEAL		1
55	10003578		. WASHER		1
60	10003314		. STEM		1
65	801418-00		. TIP AND POPPET ASSY ATTACHING PARTS		1
70	MS171433		. PIN -----*		1
75	13194-00		. BALL		1
80	8547-00		. BEARING		1
85	801417-01		. SEAT AND FILTER ASSY		1
90	10007844		. BODY, VALVE		1
95	801581-001		. KIT (REPLACES ITEM 45)		

- ITEM NOT ILLUSTRATED